



**GLOBAL FOOT-AND-MOUTH DISEASE
RESEARCH ALLIANCE (GFRA)
WORKSHOP**

**ARC-OVI,HAZYVIEW,KRUGER NATIONAL
PARK
SOUTH AFRICA**

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AN UPDATE OF FOOT-AND-MOUTH DISEASE IN CAMEROON AND CONTROL MEASURES



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PLAN OF PRESENTATION



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2. HISTORY OF FMD IN CAMEROON
3. RECENT EPIDEMIOLOGICAL SITUATION
4. CONTROL MEASURES
5. PERSPECTIVE
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1. INTRODUCTION

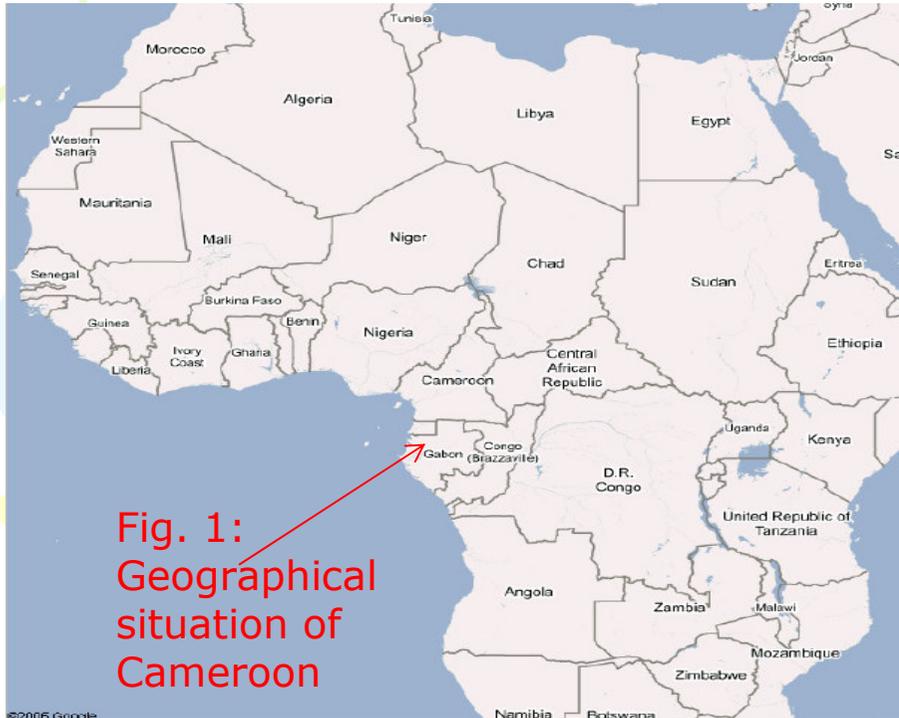


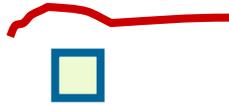
Fig. 1:
Geographical
situation of
Cameroon

- Cameroon is located in Central Africa sub region.
- Shares boundaries with Nigeria, Chad, Central African Repub., Gabon, Equatorial Guinea, Congo Brassaville.
- Cameroon covers a surface area of about 475.449 Km², with a population of about 19 millions inhabitants (2007).
- The country is divided into Ten (10) regions (Far North, North, Adamaoua, Centre, South, East, Littoral, South West, West and North West)
- Political capital –Yaoundé
- Economic capital-Douala
- Livestock sector occupies important part of National economy

INTRODUCTION(ct'd)

LEGEND

Int. Border
Main Townes



Bovine
6.000.000



Poultry
31.000.000



Porcins
1.000.000



Small ruminants
7.000.000



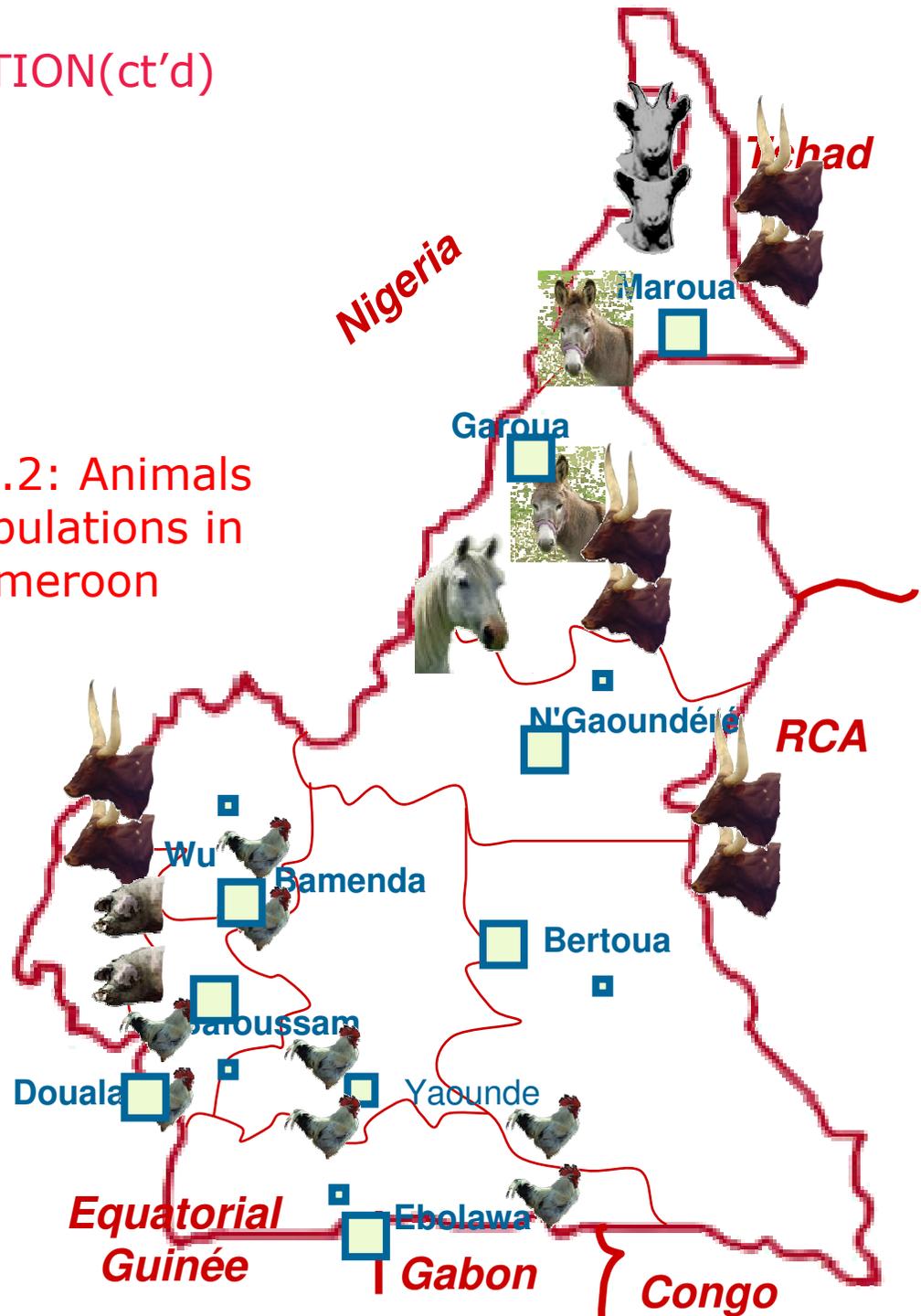
Horses
15.000



Asins
150.000



Fig.2: Animals populations in Cameroon





INTRODUCTION(ct'd)



- Most of these livestock are under constant threat from infectious diseases.
- Foot-and-Mouth disease is one of the most important especially among cattle population.
- . Is linked to cattle transhumances and transits (cattle movements).
- Cattle movements: very important ; From east to the west (from Sudan, CAR, Chad to Cameroon and Nigeria).
- Transhumance and transit involve mainly bovines and small ruminants.
- Transhumance goes along (TAD's)
- Transhumances have influences on the transmission of FMD

INTRODUCTION(ct'd)

LEGEND

Int. Border



Transit and transhumance

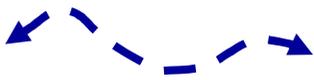
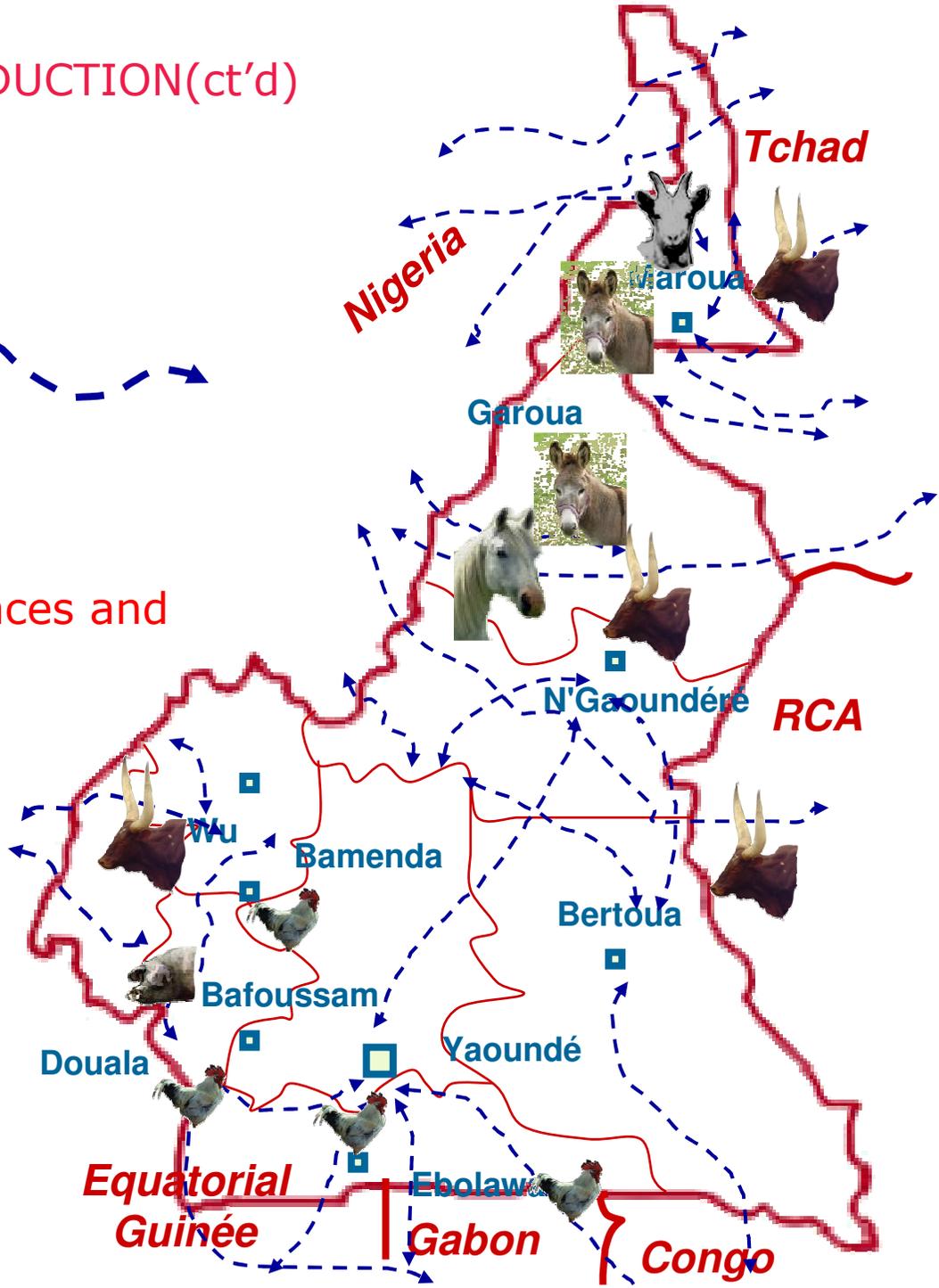


Fig. 3: Map of Transhumances and Transits





INTRODUCTION C'td



- **FMD** is a highly contagious viral disease (Picornaviridae, genus Aphthovirus) of even-toed ungulates (Artiodactyla).
- Globally is one of the most important economic disease of livestock.
- Causing high morbidity and mortality, essentially recorded in young animals (calves).



INTRODUCTION(ct'd)



- Adults animals recovered from the disease from one to two weeks after disease
- Cattle and wild buffalo is mainly affected.
- Cases were reported in pigs, sheep and goats.
- In Cameroon, disease is enzootic.



2. History of FMD in Cameroon



- The First registered case of FMD outbreak in Cameroon in 1931 (Ekue et al., 1990)
- Before the creation of LANAVET, suspected FMD samples were usually collected by field veterinarian
- Samples packaged and sent to various world reference laboratory for confirmation and serotyping.



History of FMD in Cameroon (c'td)



Table 1: presents the outbreaks registered from 1931 -1988 (source : Ekue et al., 1990)

| Year | Species affected | Course of disease | Serotypes isolated |
|-------------|----------------------------|--------------------------|---------------------------|
| 1931-1959 | Bovine | sporadic | Type O |
| 1960-1965 | Bovine | sporadic | Non type |
| 1966-1970 | Not registered | | |
| 1971-1974 | Bovine | sporadic | Non typé |
| 1975 | Bovine | sporadic | Type A |
| 1976 | Bovine | sporadic | Type A |
| 1977-1979 | Bovine | sporadic | Non typé |
| 1980 | Bovine | sporadic | Type O |
| 1981-1984 | Bovine and porcine | sporadic | Type O isolated in pig |
| 1985-1987 | Bovine, pigs, sheep,, goat | sporadic | Type A, isolated in pigs |
| 1988 | Bovine | sporadic | Type O and A |



History of FMD in Cameroon (c'td)



- From 1989 to 1994, suspected outbreaks were confirmed after collection of samples by LANAVET and sending to IAH-Pirbright.
- From 1995 -2002, Outbreaks were confirmed by analysis in LANAVET using ELISA (antibody and antigen detection) technique by IAH-Pirbright



History of FMD in Cameroon (c'td)



Table 2 : Presents result obtained by LANA VET 1987-1998

| Year | Species affected | Course of disease | Serotypes isolated |
|-------------|-------------------------|--------------------------|---------------------------|
| 1987 | Bovine, porcine | épizootic | SAT 3 |
| 1988 | Bovine, porcine | épizootic | A, O, SAT2, SAT3 |
| 1989 | Bovine | épizootic | O, A |
| 1996 | Bovine | épizootic | O, A, SAT2 |
| 1998 | Bovine | épizootic | SAT2 |

Source: LANA VET Project Proposal 2006,



History of FMD in Cameroon (c'td)



- Studies carried out between 2000-2002 in Adamaoua region by Bronsvoort and Co showed circulation of serotype 0 (in pigs, cattle), A (cattle), SAT2(cattle).
- SAT2 more rampant and was related to SAT2 isolated from samples of Saudi Arabia and Eriteria.



3. Recent Epidemiological situation c'td



- In 2005-2006, Within the PACE – Cameroon program, samples collected, part analysed in LANAVET,
- serotype SAT2, O, A were identified and these results confirmed by IAH-Pirbright



Recent Epidemiological situation C'td



Table 3: Presents the results confirmed by IAH-Pirbright 2005-2006

| Type of serotypes | Number of positive samples | Proportion relation to total number of samples tested (%) |
|-------------------|----------------------------|---|
| O | 24 | 20.2 |
| A | 3 | 2.5 |
| SAT2 | 53 | 44.5 |
| O/SAT2 | 1 | 0.8 |
| Negative | 38 | 32 |

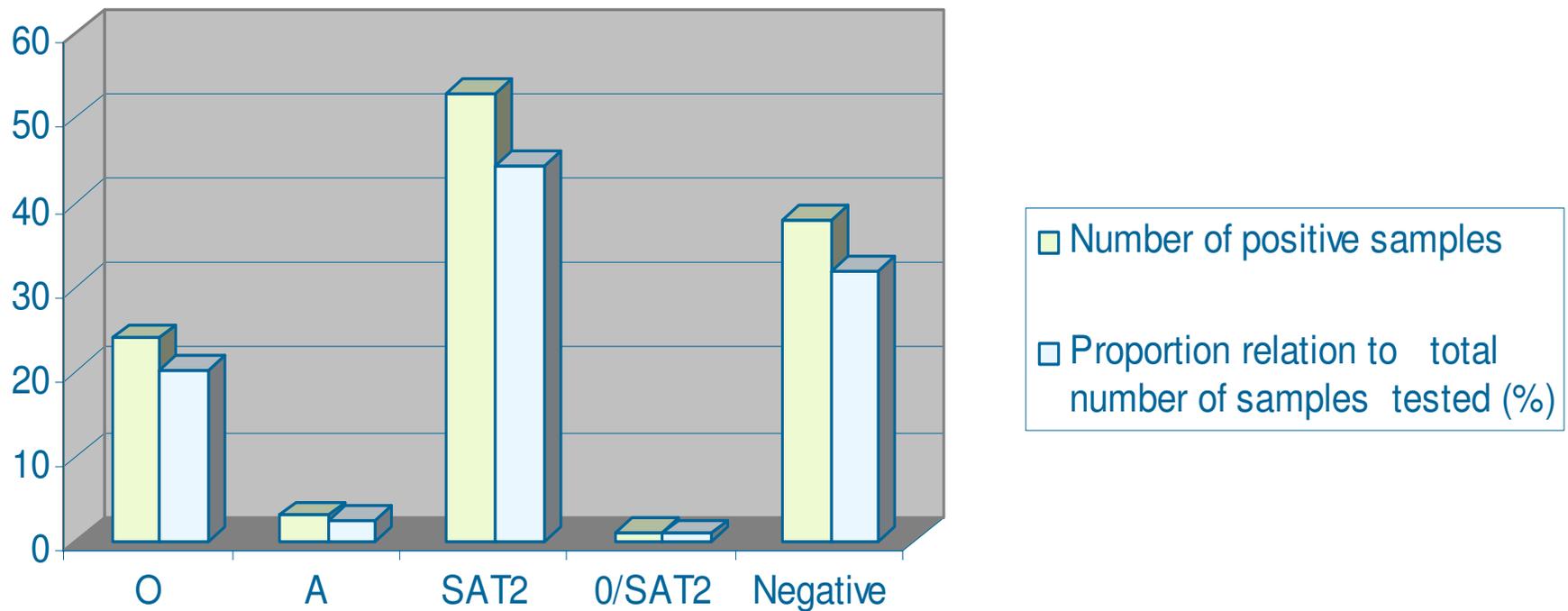
Source: LANAVET Project Proposal 2006



Recent Epidemiological situation C'td



Hist. 1: Comparasion of type of serotypes





Recent Epidemiological situation C'td



OUTBREAKS REPORTED TO OIE Between 2005 -2011

Table 4: Presents the outbreaks reported by Cameroon (CVO) to OIE 2005-2011

| S/N | Year | Outbreaks reported | Morbidity rate (%) | Mortality rate (%) | Fatality rate (%) | Serotypes isolated |
|-----|------|--------------------|--------------------|--------------------|-------------------|------------------------|
| 1 | 2005 | 143 | 21.2 | 1.4 | 6.8 | A, O, SAT1, SAT2 |
| 2 | 2006 | 69 | 37.7 | 1.4 | 3.6 | A, O, SAT1, SAT2, SAT3 |
| 3 | 2007 | | | | | |
| 4 | 2008 | 21 | 23.5 | 0.4 | 1.8 | Not typed |
| 5 | 2009 | 30 | 29.7 | 1.1 | 3.7 | Not typed |
| 6 | 2010 | 32 | 41.7 | 1.5 | 3.7 | ?? |
| 7 | 2011 | 35 | 28.5 | 0.9 | 3.1 | ?? |

Source: http://web.oie.int/wahis/public.PhP?page=country_reportingandthis_country_code=CMRanddetailed=1 1



Recent epidemiological Situation C'td



- In 2010, Ohio state university in collaboration with Plum Island labo., CARPA-Cameroon and LANAVET did some work in Far North region SAT1, SAT2, SAT3, 0, A were detected by titration.
- Plum Island isolated serotype O from samples from Far North region (Un published material)



Recent Epidemiological situation Cameroon (c'td)



- In 2011, samples were collected from some outbreaks of beef cattle in Adamaoua and North regions by LANAVET staff, sent to BVI for isolation, phylogenetic analysis and vaccine matching.
- Serotype SAT2 (Dembo-North region) and Mayo Doneyel- Ngaoundéré –Adamaoua region).
- Phylogenetic analysis carried out by WRLFMD showed that virus related SAT2/NIG/ 2008; SAT2/SUD/2007; SAT2/CAR/2005.

Recent Epidemiological situation Cameroon (c'td)

Report on FMDV SAT2 in Cameroon in 2011

Batch: WRLMEG/2011/00030
 Partial VP1 sequences received from the Botswana Vaccine Institute

◆ indicates viruses in this batch

Software: MEGA 5.0

Analysis

Analysis ----- Phylogeny Reconstruction

Scope ----- All Selected Taxa

Statistical Method ----- Neighbor-joining

Phylogeny Test

Test of Phylogeny ----- Bootstrap method

No. of Bootstrap Replications ----- 1000

Substitution Model

Substitutions Type ----- Nucleotide

Model/Method ----- Kimura 2-parameter model

Substitutions to Include ----- d: Transitions + Transversions

Rates and Patterns

Rates among Sites ----- Uniform rates

Pattern among Lineages ----- Same (Homogeneous)

Data Subset to Use

Gaps/Missing Data Treatment ----- Pairwise deletion

Codons Included ----- 1st+2nd+3rd+Non-Coding

No. of Sites : 651

No Of Bootstrap Reps = 1000

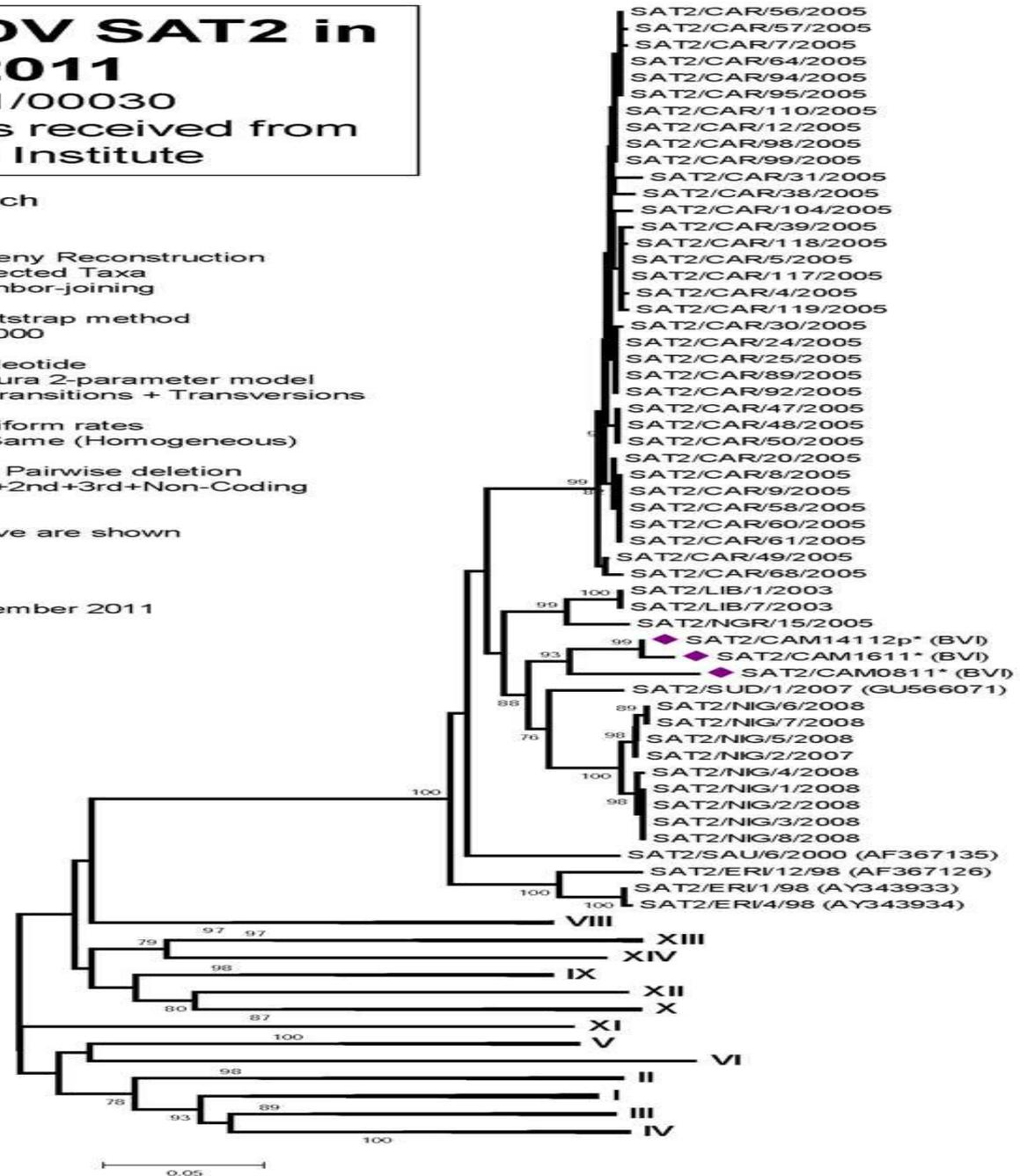
Only bootstrap values of 70% and above are shown

*, not a WRLFMD Ref. No.

N.J. Knowles & J. Wadsworth, 24 November 2011

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VII



Recent Epidemiological situation Cameroon (c'td)



- In 2012, (Period January-March), Eleven (11) outbreaks were reported to LANAVET
- Animals affected were beef cattle of local breed (Red Fulani, White Fulani and Gudali). Samples were collected by LANAVET staff. Part sent to BVI for isolation and others are analyzed locally.



Recent Epidemiological situation Cameroon (c'td)



Table 5: Outbreaks of FMD reported to LANAVET in 2012

| S/N | Locality | Region | Date reported |
|-----|-----------------------|--------|---------------|
| 1 | Bafut | NW | 23/01/2012 |
| 2 | Kuk –Wum | NW | 25/01/2012 |
| 3 | Bare-Ndop | NW | 26/01/2012 |
| 4 | Madinga-Malatuoen | W | 28/01/2012 |
| 5 | Birigaya-st region | E | 01/02/2012 |
| 6 | Grand Boulaye-Bertoua | E | 03/02/2012 |
| 7 | Touloum-Kaélé | FN | 03/03/2012 |
| 8 | Touloum –Kaélé | FN | 03/03/2012 |
| 9 | Moutourwa- | FN | 03/03/2012 |
| 10 | Vélé-Yagoua | FN | 04/03/2012 |
| 11 | Vélé-Yagoua | FN | 04/03/2012 |



Recent Epidemiological situation Cameroon (c'td)

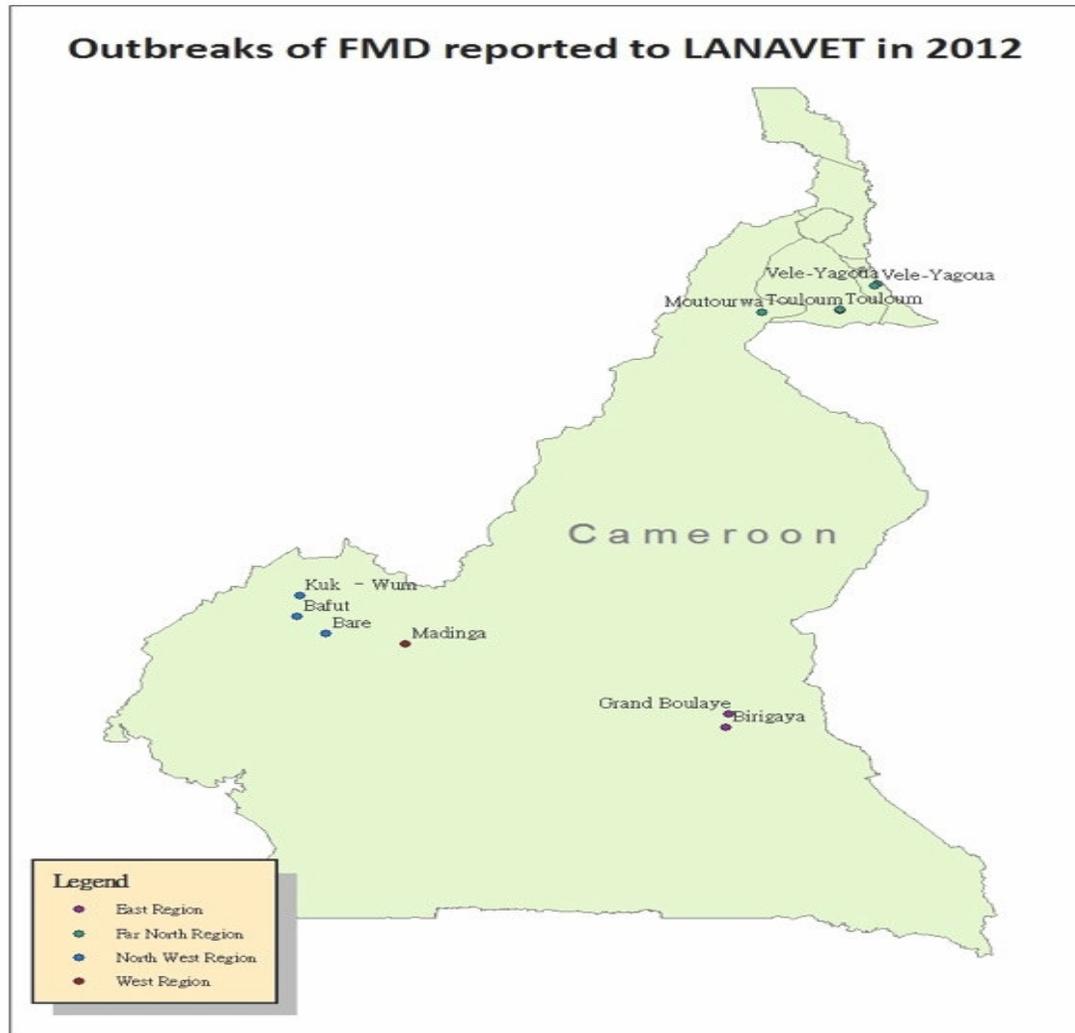


Fig.4: Outbreaks of FMD reported to LANA VET in 2012 (Jan. -March)



4. Control Measures



- There is no national control program.
- No vaccination program yet.
- However, prophylactic sanitary measures always given to farmers : separating infected herds or animal from non infected; Avoid introduction newly acquired animals without quarantine; disinfection; treatment of wounds



5. Perspective



- LANAVET in collaboration with Ohio state University and Plum Island to carry out studies to determine the various serotypes circulating in Cameroon.
- LANAVET in collaboration with Botswana vaccines Institute also to determine the serotypes circulating, vaccine matching with goal to start vaccination in Cameroon. BVI provides the vaccines.
- LANAVET in collaboration with IAEA will implement LAMP PCR in screening FMD samples.



6. CONCLUSION



- FMD is enzootic in Cameroon
- So far the following serotypes: SAT1, SAT2, SAT3, O,A have reported .
- Much works needs to be done to determine the actual epidemiological situation of the disease in Cameroon
- A regional (CEMAC) control program highly recommended as borders are porous.



7. BIBLIOGRAPHY

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THANK YOU FOR YOUR ATTENTION





